Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of the Spectrum Sharing Plan Among	)	
Non-Geostationary Satellite Orbit Mobile	)	IB Docket No. 02-364
Satellite Service Systems in the 1.6/2.4 GHz	)	
Bands	)	

REPLY COMMENTS OF IRIDIUM SATELLITE, LLC

R. Michael Senkowski
Peter D. Shields
Jennifer D. Hindin
Melissa A. Reed
WILEY REIN & FIELDING LLP
1776 K Street, N.W.
Washington, DC 20006
202-719-7000

Attorneys for Iridium Satellite, LLC

September 23, 2004

EXECUTIVE SUMMARY

Iridium applauds the Commission's efforts to adopt a sharing plan in the Big LEO band that seeks to promote a competitive and efficient allocation of spectrum among the Big LEO MSS operators. The Commission has done a commendable job of recognizing the evolving dynamics of the MSS marketplace and taking steps to ensure that the Big LEO operators are allocated sufficient spectral resources to allow them to serve the public interest by meeting the vital needs of their customers. However, despite the Commission's efforts, the current allocation of spectrum between the two Big LEO MSS operators, Iridium and Globalstar, has not kept pace with developments in the MSS industry. The sharing plan proposed in the *Big LEO Spectrum Sharing Order and FNPRM* is a fair and effective remedy for the inefficiency of the spectral allocation in the 1616-1618.25 MHz band that furthers the Commission's goal of ensuring that the MSS industry remains a competitive, spectrally efficient industry in the future.

In its comments filed in this proceeding, Globalstar attempts to solidify its anticompetitive advantage in the Big LEO band by falsely asserting that Iridium has provided no evidence to support its request for additional spectrum. However, throughout the record in this docket, Iridium has provided thorough and persuasive documentation of its urgent spectral needs. In its January 2003 Spectrum Report, and in numerous STA spectrum usage reports, Iridium has offered extensive technical analyses to demonstrate how insufficient access to spectrum has led to system failures both domestically and globally, and stifled Iridium's ability to offer innovative services offered by other MSS operators. It is apparent from Globalstar's false, unsupported accusations that it is attempting to mislead the Commission by distorting the record.

Globalstar also improperly depicts its current spectrum allocation to advance its asserted need for exclusive use of spectrum above 1616 MHz. As the Commission noted in the *Big LEO Spectrum Sharing Order and FNPRM*, and as the history of spectrum allocation among MSS operators makes clear, the considerable amount of spectrum allocated to MSS operators using CDMA technology was never intended to be used by a single operator on an exclusive basis. Despite Globalstar's complaints of severely limited spectrum resources, under the Commission's proposed band plan Globalstar will continue to have access to 27.85 MHz of spectrum, 17.5 MHz of which is unencumbered.

Finally, Globalstar's attempts to refute the technical feasibility of sharing 2.25 MHz of spectrum in the 1616-1618.25 MHz band are invalid and use improper assumptions. Globalstar's comments grossly misstate several technical facts regarding its ability to share in the Big LEO band. Globalstar claims that it cannot meet FAA and RTCA standards without the exclusive use of two 1.23 MHz channels above 1616 MHz. However, the standard Globalstar relies upon, RTCA DO-228, relates to GNSS equipment and thus places no restrictions whatsoever on aviation services. Similarly, Globalstar's claims that it will be unable to offer ATC services under the proposed spectrum sharing plan is unsupported because the Commission never designated the spectrum at issue in this proceeding for ATC use.

For all of these reasons, the Commission should adopt its proposed sharing plan for an additional 2.25 MHz in the 1616-1618.25 MHz band.

TABLE OF CONTENTS

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of the Spectrum Sharing Plan Among	)	
Non-Geostationary Satellite Orbit Mobile	)	IB Docket No. 02-364
Satellite Service Systems in the 1.6/2.4 GHz	)	
Bands	)	

REPLY COMMENTS OF IRIDIUM SATELLITE, LLC

Iridium Satellite, LLC ("Iridium"), by its attorneys, hereby respectfully submits these reply comments in the proceeding referenced above.[1] As the record in this proceeding amply establishes and as is demonstrated below, there is a compelling and pressing need for Iridium and Globalstar to share mobile satellite service ("MSS") spectrum in the 1616-1618.25 MHz band.

I. THE RECORD SUPPORTS SPECTRUM SHARING IN THE 1616-1618.25 MHZ BAND FOR BIG LEO MSS

A. The Commission's Policy Considerations For Big LEO Spectrum Sharing Support Additional Sharing In The L-Band

Allowing the Big LEO operators to share spectrum in the 1616-1618.25 MHz band will advance the Commission's stated policy goal of promoting spectral efficiency by ensuring that the spectral capacity of the Big LEO band is fully utilized by both MSS

[1] Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands; Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, IB Dkt. No. 02-364, ET Dkt. No. 00-258, *Report and Order, Fourth Report and Order and Further Notice of Proposed Rulemaking*, FCC 04-134 (July 16, 2004) ("*Big LEO Spectrum Sharing Order and FNPRM*").

operators. As the Commission's Spectrum Policy Task Force has noted, spectral efficiency occurs when "the maximum amount of information is transmitted within the least amount of spectrum."[2] The Commission has also found that as a means of achieving the goal of spectral efficiency, spectrum sharing should be implemented wherever possible.[3] Currently, the 1616-1618.25 MHz band is being underutilized; Globalstar holds exclusive access to the spectrum in this band when the record in this docket makes clear that both MSS operators can efficiently use the same spectrum without creating harmful interference to one another. Accordingly, the Commission should adopt its proposed sharing plan for an additional 2.25 MHz in the Big LEO band.

B. The Record Is Replete With Demonstrations Of Iridium's Need For Additional Spectrum To Meet Growing Consumer Demand And Provide New Services, And Globalstar Has Done Nothing To Refute That Showing

Throughout the record in this docket, Iridium has demonstrated a compelling and urgent need for additional spectrum in order to meet existing demands and improve the quality of service provided to its current and future customers.[4] Iridium has consistently supported its claims by offering extensive technical analyses documenting current strains on its system due to inadequate spectrum. Yet, despite the clear evidence that Iridium's current spectral allocation is insufficient to meet growing customer demands, Globalstar

---

[2] *FCC Spectrum Policy Task Force Report*, ET Dkt. No. 02-135, at 21 (rel. Nov. 2002) ("Spectrum Task Force Report").

[3] *Big LEO Spectrum Sharing Order and FNPRM*, ¶¶ 45-47.

[4] *See, e.g.*, Iridium Satellite Spectrum Report, IB Dkt. No. 01-185, at 3-4 (Jan. 13, 2003) ("Iridium Spectrum Report"); Comments of Iridium Satellite, LLC, IB Dkt. No. 02-364, at 32-34 (July 11, 2003) ("Iridium Comments on NPRM"); Reply Comments of Iridium Satellite, LLC, IB Dkt. No. 02-364, at 4-6 (July 25, 2003) ("Iridium Reply Comments on NPRM").

persists in its efforts to obstruct Iridium's growth by asserting spurious claims unsupported by any real-world evidence.

In its January 2003 Spectrum Report, Iridium demonstrated that steadily and rapidly growing usage rates of Iridium services had led to increased call drop rates and reduced call establishment rates both globally and domestically, and that absent an increased allocation of spectrum, such rates would continue to proliferate at a dramatic pace. Iridium further demonstrated that adverse drop and establishment rates became most pronounced when system capacity exceeded 80% of system capacity usage.[5] Iridium's estimates of future usage rates suggested that Iridium's system would consistently experience satellite loading rates of 80% or greater for consecutive days in the immediate future, thus creating a perpetual strain on Iridium's system.[6] Iridium later provided evidence of this prediction in its monthly STA spectrum usage reports to the International Bureau.[7] Most notably, these reports document consistent Iridium system loading above 80% capacity each month for the past 16 months. This percentage loading level includes the additional spectrum provided under the STA.

Iridium's technical analysis indicated that these failures were due not only to demands imposed on the Iridium system as a result of military conflicts in the Middle East, but also as a result of the natural growth trends of Iridium's core services, such as

[5] Iridium Spectrum Report at 4-6.

[6] *Id.*

[7] *See, e.g.*, Iridium Comments on NPRM; Iridium Reply Comments on NPRM; Letter from Peter D. Shields, Counsel to Iridium Satellite, LLC, to James L. Ball, Chief of the Policy Division, FCC (Dec. 18, 2003); *Ex parte* presentation of Iridium Satellite, LLC, IB Dkt. No. 02-364 (Mar. 17, 2004).

its significant operations in rural and underserved markets throughout the world.[8] Providing services to these markets is highly demanding on Iridium's system, and given the growth trends throughout the MSS industry and particularly in Iridium's core markets, Iridium will not be able to continue to service its customers' growing needs and expand its operation without access to additional spectrum.

Iridium has also documented that insufficient access to spectrum has stifled Iridium's ability to compete in the MSS market by prohibiting it from providing the full range of quality services offered by other wireless providers and its competitors. For instance, as Iridium has previously noted, Iridium's services are currently limited to half-rate data rates and voice quality levels, as compared to the full data rate and voice quality levels provided by many of Iridium's competitors.[9] In order to provide these higher quality services to its customers and remain a viable competitor in the MSS industry, Iridium requires access to an additional 2.25 MHz of spectrum on a shared basis.

In the face of these consistent and persuasive documentary offerings by Iridium supporting its growing spectral needs, Globalstar continues to attempt to mislead the Commission by falsely alleging that Iridium has provided "nothing" in response to the Commission's request for Iridium's spectrum use.[10] As detailed above and in its comments, however, Iridium provided the Commission with numerous, detailed data documenting Iridium's spectrum usage. Thus, it is apparent that in asserting these

---

[8] Iridium Spectrum Report at 2; Iridium Commentson NPRM at 17-18; Iridium Reply Comments on NPRM at 4-6.

[9] *See* Iridium Comments on NPRM at 21; Iridium Reply Comments on NPRM at 7; Comments of Iridium Satellite LLC, IB Dkt. No. 02-364, at 3 (Sept. 8, 2004) ("Iridium Comments").

[10] Comments of Globalstar LLC, IB Dkt. No. 02-364, at 15 (Sept. 8, 2004) ("Globalstar Comments").

patently false accusations Globalstar is again attempting to divert attention from the substantive issues being addressed in this proceeding.

Globalstar has also misrepresented the Commission's observation that increased demand for Iridium's service appeared to be "sporadic and geographically-based." The Commission has never concluded, as Globalstar suggests, that Iridium's request to share additional spectrum is based on "nothing more than a 'sporadic and geographically-based need.'"[11] Rather, in support for its position that sharing of L-band spectrum is more equitable than granting either operator exclusive access to that band, the Commission explained that it appeared, based primarily on increased demand for Iridium's service resulting from the conflict in the Middle East, that Iridium's service was sporadic and geographically-based.[12]

Notwithstanding Globalstar's mischaracterization of this statement in the *Big LEO Spectrum Sharing Order and FNPRM*, and as Iridium explained in its comments, the Iridium System is in fact fully integrated on a global level. As previously explained, because the Iridium System is designed to efficiently use the same spectrum across all geographies, a geographically-focused spike in system usage creates a strain throughout

[11] *Id.*

[12] *Big LEO Spectrum Sharing Order and FNPRM*, ¶ 47. Interestingly, although Globalstar continues to attempt to show that Iridium does not need extra spectrum to support its services, Globalstar has never provided any information to the record showing that it provides global, sustained, high traffic loads throughout its entire 27.85 MHz of L- and S-band spectrum. In fact, the two instances of high traffic demand submitted by Globalstar in the record, the Middle East in 2003, *see* Globalstar, L.P. and Globalstar USA, L.L.C. Petition to Deny Iridium June 9, 2003 Request for Extension of STA, STA-MSC-20030515-0089, SES-MSC-20030515-00666 (June 11, 2003) , and recently in Florida due to Hurricanes Charley and Frances, *see* Comments of Globalstar, at 7-8, are both prime examples of "sporadic and geographically-based" needs.

the entire Iridium network.[13] It is for this very reason that Iridium requires access to additional spectrum to meet the unpredictable rolling peaks that constrain Iridium's entire system.[14]

It is clear that Globalstar's primary goal in this proceeding is to maintain the distinct competitive advantage it enjoys in the Big LEO band by preventing its only competitor from obtaining a fair allocation of spectrum. Although Globalstar currently has exclusive access to substantially more spectrum than Iridium, throughout its comments Globalstar repeatedly advances unsupported, misleading statements to suggest that Iridium is overstating its spectrum needs and that allowing Iridium access to even a minimal amount of spectrum will somehow disrupt the Globalstar network. The Commission should not be misled by Globalstar's anticompetitive accusations.[15]

C. Globalstar's Attempts To Refute The Technical Feasibility Of Sharing 2.25 MHz Of Spectrum In The 1616-1618.25 MHz Band Are Invalid And Use Improper Assumptions

In its comments, Globalstar assumes an extremely unrealistic Iridium interference budget to support its claim that Iridium uplink signals would raise Globalstar's interference and noise density floor by 15% at the satellite receiver. This calculation is

[13] Iridium Comments at 4.

[14] Indeed, it is hardly sporadic that the Iridium system has experienced in excess of 80% capacity loading in each of the last 16 months.

[15] Globalstar's request that the Commission postpone the current proceeding until it renders a decision on Globalstar's Petition for Reconsideration of the *Big LEO Spectrum Sharing Decision*, Globalstar Comments at 4 n.6, is a prime example of Globalstar's anti-competitive tactics. It is also unsupported and procedurally invalid. The 3.1 MHz of spectrum made available to Iridium on a shared basis in the *Big LEO Spectrum Sharing Decision* are not at issue in the Commission's further proposal concerning sharing the 1616-1618.25 band; therefore resolution of the arguments raised by Globalstar's Petition have no bearing on the outcome of the instant proceeding and the Commission should not entertain the request. Globalstar's request for deferral is just another disingenuous attempt to delay Iridium's access to additional spectrum.

based on unrealistic assumptions and is inconsistent with Iridium's satellite operations and, more importantly, with Globalstar's previous, more accurate estimates of peak loading for the Iridium system.

In particular, the most egregious assumption made by Globalstar when it attempted to calculate the interference effect of sharing spectrum with Iridium is that the "Number of Iridium carriers in 1.23 MHz at capacity" is 88.5.[16] This number is based on the following rationale:

- Number of 41.67 kHz Iridium carriers within Globalstar 1.23 MHz channel: 29.5
- Number of Iridium spot beams per Globalstar beam: 3
- Total Iridium carriers per Globalstar carrier and beam: 3 x 29.5 = 88.5

This calculation assumes that there is 100% loading of all Iridium channels, with 100% frequency reuse. However, the typical Iridium network configuration has the Iridium carrier frequencies repeated in every sixth spot beam, or only 17% frequency reuse. Indeed, these assumptions are confirmed by Globalstar's previous filings in this same docket. Prior to this latest assumption, Globalstar properly estimated the maximum number of Iridium carriers per Globalstar channel and beam would be about 18, when taking into account frequency reuse.[17]

Moreover, Globalstar claims that the "Average Iridium transmit power per carrier" is "3 dBW."[18] In its comments, Iridium has explained that the Iridium terminal peak power, which occurs within a single TDMA time slot, must be averaged over the

[16] Globalstar Comments, Technical Appendix at 2.

[17] *Ex parte* presentation of Globalstar LLC, IB Dkt. No. 02-364, at 6 (filed Mar. 19, 2004).

Iridium TDMA frame.[19] This provides a reduction of 10.4 dB. Typical power control levels lower this amount by another 5 dB and consideration of a 40% voice activity factor reduces the average transmit power by another 4 dB. The resulting typical Iridium user terminal transmit power therefore is -10.9 dBW.

Inserting these numbers into Globalstar's same interference budget, results in the following data:[20]

Frequency	1618	MHz
Number of Iridium beams per Globalstar beam	3	
Number of Iridium carriers in 1.23 MHz	18	
Average Iridium transmit power per carrier	-10.9	dBW
Typical range at 40 deg. Elev.	1952	km
Path loss	-162.431	dB
Interference density per beam per 1.23 MHz channel from Iridium users received at Globalstar satellite input	-221.677	dBW/Hz

At Globalstar satellite		
Receiver antenna gain	16	dB
Typical self interference density	-193	dBW/Hz
Typical self interference plus thermal noise density	-192.485	dBW/Hz
Allowable % degradation due to external interference	3	%
Allowable external interference (for 3% degradation of self-interference plus noise)	-192.357	dBW/Hz
Total interference and noise density	-192.480	dBW/Hz

[18] Globalstar Comments, Technical Appendix at 2.

[19] Iridium Comments at 17.

[20] In this interference budget, as well as Globalstar's original link budget, the Globalstar receiver antenna gain is noted, but, correctly, not used in the actual interference level calculations, because Globalstar's and Iridium's signals are cross-polarized.

Actual degradation in self-interference plus noise	0.1	%

Therefore, when realistic numbers are used within Globalstar's own interference budget, the degradation in the noise and interference density floor due to Iridium interference is 0.1%. This number remains squarely below Globlastar's cited "acceptable limit for external interference of 3%."[21] It is, therefore, inconceivable that Globalstar, based on its own calculations with proper assumptions, can claim that it will experience any interference whatsoever from the shared use of the 1616-1618.25 MHz band. Indeed, under normal operating conditions, where the Iridium network is not completely loaded within a particular sector, the amount of interference and noise provided by Iridium into this shared band will be negligible, as demonstrated by Globalstar's link budget.

More importantly and consistent with this theoretical analysis of the potential for interference at Globalstar's satellite receiver, Iridium and Globalstar's ongoing shared use of spectrum in the L-band has not produced any actual interference. In April 2003, when Iridium was heavily loaded in 1620.10-1621.35 MHz (Channel 9) and operating pursuant to STA, Globalstar informed the Commission that it had not experience interference from Iridium's use of the spectrum. Specifically, after monitoring its "own satellites and Iridium's use of Channel 9 continuously for [ ] 12 days, Globalstar reported that it had "not experienced harmful interference into our satellites."[22] Thus, Globalstar has been unable to provide real or hypothetical evidence of interference caused by sharing spectrum with Iridium.

[21] Globalstar Comments, Technical Appendix at 2.

[22] *See* Letter from William F. Adler, Counsel for Globalstar, to Thomas S. Tycz, Chief, Satellite Division, International Bureau, FCC, Attachment 2, at 1 (May 1, 2003).

II. GLOBALSTAR'S REQUEST FOR EXCLUSIVE ACCESS TO UNENCUMBERED SPECTRUM ABOVE 1616 MHZ IS UNSUPPORTED IN THE RECORD AND IN THE HISTORY OF THIS PROCEEDING

A. The Commission Never Contemplated Providing Globalstar Exclusive Access To "Unencumbered" Spectrum

Since its initial allocation of MSS spectrum among five applicants, the Commission has always intended Globalstar to share its spectrum with other MSS operators. In the original Big LEO spectrum allocation, the Commission granted rights to 27.85 MHz of spectrum to the four CDMA licensees, including Globalstar, based on the assumption that four licensees would share this spectrum.[23] Of the four Big LEO CDMA systems ultimately licensed by the Commission, only the Globalstar system was built. Under its plan, the Commission never contemplated providing Globalstar exclusive access to 27.85 MHz of unencumbered spectrum. Indeed, the Commission clarified in the *Big LEO Spectrum Sharing Decision and FNPRM*, nothing could be further from the truth. The Commission noted that "the Globalstar license never conferred an unconditional right to operate in the entire spectrum originally assigned for shared use by multiple CDMA systems."[24] Moreover, the Commission asserted that "Globalstar should have had no reason to believe it had sole right to the spectrum if other operators failed to implement their systems …"[25] Clearly, the Commission has discussed and rejected this

[23] Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and the 2583.5-2500 MHz Bands for Use by the Mobile-Satellite Service, Including Non-geostationary Satellites, *Report and Order*, 9 FCC Rcd 536, 536 (1994) ("*Big LEO Order*"), *modified by* 10 FCC Rcd 3196 (1995). Under this allocation, Iridium's grant of 5.15 MHz of spectrum was intended to be roughly proportionate to the spectrum authorized to its competitors.

[24] *Big LEO Spectrum Sharing Decision and FNPRM*, ¶ 86.

[25] *Id.*

argument raised by Globalstar, yet Globalstar continues to disingenuously argue for its "rights" to exclusive, unencumbered spectrum.

B. Globalstar Can Meet FAA And RTCA Standards While Providing Aviation Services Both Below 1616 MHz And Above 1616 MHz On A Shared Basis

Globalstar continues to claim that it "needs at least two unencumbered 1.23 MHz channels above 1616 MHz for its aviation service."[26] Once again, Globalstar erroneously uses RTCA document DO-228 to claim that only spectrum above 1616 MHz must be used for aviation services. In its comments, Globalstar states: "The Minimum Operational Performance Standards for AMSS systems adopted by RTCA in its RTCA Document 228 include a restriction on harmful interference into GPS."[27] This is incorrect. RTCA DO-228 is not a minimum operational performance standard for AMSS systems, it is a minimum operational performance standard for Global Navigation Satellite System ("GNSS") Airborne Antenna Equipment.[28] As such, it places no restrictions of any kind on AMSS equipment.

As an attempt to support Globalstar's claim that it requires unencumbered spectrum above 1616 MHz for aviation services, Sagem Avionics, a Globalstar-based aviation satellite telephone product provider, submitted late-filed comments alleging that any sharing of the spectrum above 1616 MHz would "subject Sagem's and Globalstar's

[26] Globalstar Comments at 10.

[27] *Id.* at 9.

[28] *See* RTCA SC-159, *Minimum Operational Performance Standards For Global Navigation Satellite System (GNSS) Airborne Antenna Equipment*, 8 1995 RTCA, Inc., DO-228 (Oct. 20, 1995).

aviation service customers to unacceptable and damaging interference."[29] However, Sagem Avionics provides no corroborative data to support this claim. Sagem Avionics does not even describe any manner in which Iridium interference could affect Sagem's equipment. Given that Sagem Avionic's equipment must receive Globalstar signals in the S-band, it is extremely improbable that Iridium's L-band signals would provide any measurable interference into the Sagem Avionics receiver. Moreover, if Sagem Avionics claims that Iridium's signals would cause L-band interference into the Globalstar satellite receiver, then that is a technical issue that only Globalstar can address. Iridium can only assume that Globalstar submitted their erroneous interference budget to Sagem Avionics, which states that Iridium would increase the noise and interference density level by 15%. As demonstrated above, a maximum increase in this level of only 0.1% should be assumed.

Finally, Globalstar and Sagem Avionics claim to be using "state of the art" filters to protect their systems.[30] However, neither commenter offers any information on the alleged inability of these filters to protect it from Iridium's operations. Because these commenters have not substantiated these claims, the Commission cannot assess whether other filters could mitigate claims of potential interference. The Commission should not give any credit to these statements.

[29] Comments of Sagem Avionics, Inc., IB Dkt. No. 02-364, at 2 (Sept. 14, 2004) ("Sagem Avionics Comments").

[30] Globalstar Comments at 9-10, Sagem Avionics Comments at 2.

C. Globalstar Has Access to More Spectrum And Handles Less Traffic Than Iridium

Despite Globalstar's complaints of severely limited spectrum resources, it continues to have access to 27.85 MHz of spectrum. By comparison, even after the Commission's grant of shared access to the 1618.25-1621.35 MHz band, Iridium has access to only 8.25 MHz . Even so, the Iridium system is greatly outperforming the Globalstar system, handling a volume of traffic more than 1 ½ times greater, in less than one-fourth the spectrum, than Globalstar's in the first half of 2003.[31] And, because the Iridium System was designed to operate in just 10.5 MHz, granting Iridium shared access to an additional 2.25 MHz of spectrum will provide the Iridium System access to all of the spectrum it can utilize immediately. Iridium's operations in the system's designed 10.5 MHz will also be more efficient and provide higher quality service.

Even if the Commission had not fully addressed Globalstar's latest specious argument concerning its rights to "exclusive" spectrum, Globalstar will continue to have access to at least 17.5 MHz of "unencumbered" spectrum in the 1.6 and 2.4 GHz bands. Globalstar's assertion that under the Commission's proposal it will have no unencumbered spectrum[32] appears to rely on a definition of "encumbered spectrum" that includes adjacent channel operations, as well as the valid definition of co-channel operations.[33] Globalstar's inclusion of its rendition of the Big LEO spectrum plan

---

[31] *See* Comments of L/Q Licensee, Inc., Globalstar, L.P., and Globalstar USA, L.L.C., IB Dkt. No. 02-364, Attachment A (July 11, 2003) (reporting 2.5 million minutes of use in the United States and the Caribbean in the second quarter of 2003); Iridium Comments on NPRM at 21 (noting that Iridium carried over 28 million minutes of use in the Middle East region during the same period).

[32] Globalstar Comments at 12.

[33] Globalstar asserts that it "accommodated Iridium by discontinuing use of [channels 8 and 9] in the Middle East region" while Iridium has had STA to operate in those

distorts the reality of the current allocation of spectrum in the L-band by mislabeling certain bands of spectrum as "shared."[34]

For example, Figure 1 in Globalstar's comments erroneously states that the frequency band 1610 – 1616 MHz is "CDMA Shared."[35] In fact, Globalstar is the only CDMA provider, so any allegations that it is sharing this band with another CDMA provider are illusory. Furthermore, Globalstar has argued, without any citation to a Commission decision, that the Commission has long recognized that the 1610 to 1616 MHz segment of the Big LEO band is encumbered by interservice sharing requirements.[36] However, the radio astronomy services that Globalstar cites to are geographically limited (not nationwide or global) and can be protected, as they are today. In addition, these passive services only require protection from 1610.6 to 1613.8 MHz, not the full 1610 to 1616 MHz band. Finally, as the actual band plan proposed in this rulemaking provided below illustrates, Globalstar continues to have unencumbered, exclusive access to 11.5 MHz of spectrum at 2.4 GHz for its downlinks. In fact, the Commission characterized this 11.5 MHz of spectrum in the S-Band as "essentially exclusive."[37]

---

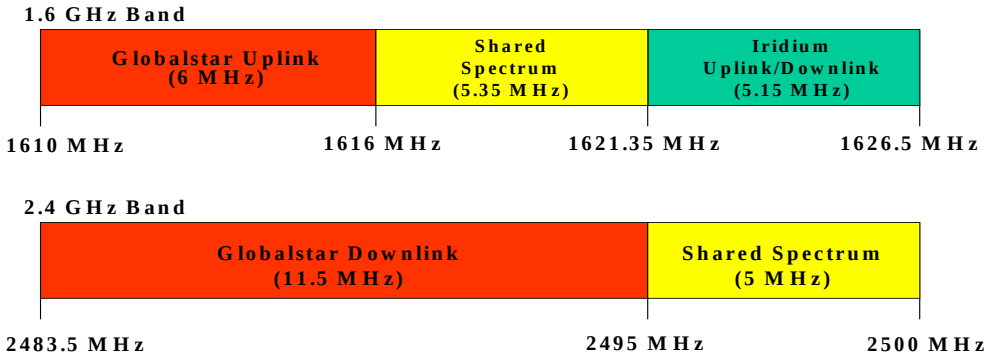
channels. Globalstar Comments at 6. If Globalstar was able to turn off channels 8 and 9 in the Middle East, then it clearly did not need those channels to sufficiently address its capacity needs.

[34] Globalstar Comments at 13, Figure 1.

[35] *Id.*

[36] *Id.* at 11.

[37] *Big LEO Spectrum Sharing Decision and FNPRM*, ¶ 66.



As is clear from this depiction of the Commission's proposed band plan, Globalstar will continue not only to have access to 17.5 MHz of unencumbered spectrum, but will also retain operating rights to an additional 10.35 MHz of shared spectrum for a total of 27.85 MHz of spectrum. In contrast, Iridium will only have access to 5.15 MHz of unencumbered spectrum and 5.35 MHz of shared spectrum.

D. The FCC Should Reject Globalstar's Alleged Inability To Offer ATC Under The Proposed Spectrum Sharing Because ATC Is Secondary To MSS Operations In The L-Band And, In Any Event, Is Not Authorized Above 1616 MHz

In its comments Globalstar argues that it will require 5 MHz of spectrum to effectively deploy Ancillary Terrestrial Component ("ATC") because of frequency reuse requirements.[38] Moreover, Globalstar asserts that because of the need to coordinate satellite and terrestrial services, it would require certain channels of non-shared spectrum

[38] Globalstar Comments at 10.

to be used for MSS only.[39] Therefore, according to Globalstar, if the Commission were to adopt the proposed spectrum sharing plan, it would be unable to implement ATC.

Iridium assumes that Globalstar has misstated its case, as it claims to only require 5 MHz for ATC operations.[40] If this is an accurate statement, then Globalstar would only need 2.5 MHz from its L-band spectrum and 2.5 MHz from its S-band spectrum to fully implement ATC operations. This would leave 3.5 MHz of L-band spectrum and 9 MHz of S-band spectrum, both on an exclusive basis, for Globalstar's MSS operations. As such, it is unclear why Globalstar is disputing the viability of providing ATC services and MSS in its extensive spectrum holdings.

Furthermore, the technical appendix that Globalstar attached to its comments does not address the implementation of ATC and its effect on MSS operations. As such, Globalstar has not detailed any significant technical rationale for its assertions that ATC or MSS operations would be adversely affected by sharing of an additional 2.25 MHz of L-band spectrum.

Moreover as Iridium explained in its comments, the Commission's proposed spectrum sharing plan will not affect Globalstar's ability to provide viable ATC services.[41] Because the Commission did not permit ATC above 1616 MHz in the L-band,[42] the spectrum at issue in this proceeding is not available for ATC use.

---

[39] *Id.* at 11.

[40] *Id.* at 10.

[41] Iridium Comments at 15-16.

[42] Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962, 2010 (2003) ("*ATC Order*"); *see also Big LEO Spectrum Sharing Order*, ¶ 90.

Furthermore, ATC operations are secondary to MSS operations in the L-band and therefore should not drive the Commission's decision on sharing spectrum between the two MSS operators. In fact, the Commission's decision to permit MSS operators to seek authority to integrate ATCs into their networks was premised on the idea that the ATC operators would not use "any additional spectrum resources beyond spectrum already allocated and authorized by the Commission for MSS in these bands."[43] The Commission "authorize[d] MSS ATC subject to conditions that ensure that the added terrestrial component remains ancillary to the principal MSS offering."[44] Accordingly, the Commission should not base its decision regarding the use of the 1616-1618.25 MHz band on Globalstar's potential future ability to offer an ancillary service in a different band of spectrum.

In any event, Globalstar's previous filings on ATC are inconsistent with its arguments here. Previously in this proceeding, Globalstar has stated with respect to ATC:

> The only feasible method to manage the interference, and for the satellite operator to comply with the Commission's geographic coverage requirements for licensed satellite systems, is to offer terrestrial service in selected locations on selected channels, reusing the channels outside the relatively small boundaries of the terrestrial service area. As explained in the technical discussion, the terrestrial and satellite services require complex coordination "on the fly" between the satellite and terrestrial modes. Through dynamic frequency assignment, a single operator could

[43] *ATC Order* at 1964.

[44] *Id.* at 1964-65.

> offer both satellite and terrestrial services in certain locations while maintaining universal satellite coverage.[45]

As such, Globalstar has previously argued that a single operator could offer both satellite and terrestrial services in certain locations without harmful effect to the satellite network. Globalstar has also argued that in rural and underserved areas, it would not deploy ATC services but would reuse the same frequencies used by the ATC system in urban markets.[46] Because of this manner of ATC deployment, Globalstar has argued that "…rural areas can have access to the full MSS spectrum available."[47]

Any argument that Globalstar now offers the Commission concerning the need for "exclusive" spectrum for ATC services are in stark contrast with these previous filings. Globalstar has argued that ATC service will only supplement coverage in urban markets, while the full spectrum available to the MSS network will be usable in rural and underserved areas. Globalstar cannot now change its argument to claim that it requires "exclusive" ATC spectrum. Furthermore, its MSS network will continue to have access to 6.35 MHz of spectrum that is not affected by ATC operations. As the Commission and Iridium have definitively shown, sharing between Globalstar and Iridium satellite networks is achievable. Therefore, Globalstar will have sufficient spectrum capacity to provide both ATC and MSS, if it so desires.

---

[45] Supplemental Comments of Globalstar, L.P., IB Dkt. 01-185, at 5 (filed Mar. 22, 2002) ("Supplemental Comments of Globalstar").

[46] *See*, *e.g.*, *id.* at 5-6; Reply Comments of Globalstar, L.P. and L/Q Licensee, Inc., IB Dkt. No. 01-185, at 4 (Nov. 13, 2001).

[47] Supplemental Comments of Globalstar, Technical Appendix at 28.

III. CONCLUSION

For the foregoing reasons, the Commission should adopt the plan set forth in the *Big Leo Spectrum Sharing Order and FNPRM* and permit additional spectrum sharing in the 1616-1618.25 MHz between the two operational MSS operators, Iridium and Globalstar.

Respectfully submitted,

IRIDIUM SATELLITE, LLC

/s/ R. Michael Senkowski
R. Michael Senkowski
Peter D. Shields
Jennifer D. Hindin
Melissa A. Reed
WILEY REIN & FIELDING LLP
1776 K Street, N.W.
Washington, DC 20006
202-719-7000

Its Attorneys

September 23, 2004